CO-ORDINATION OF GALACTIC RESEARCH

INTERNATIONAL ASTRONOMICAL UNION

SYMPOSIUM No. 1

HELD AT GRONINGEN, 22-27 JUNE 1953

CO-ORDINATION OF GALACTIC RESEARCH

EDITED BY

A. BLAAUW

Yerkes Observatory



CAMBRIDGE AT THE UNIVERSITY PRESS 1955

PUBLISHED BY THE SYNDICS OF THE CAMBRIDGE UNIVERSITY PRESS

London Office: Bentley House, N.W. I American Branch: New York

Agents for Canada, India, and Pakistan: Macmillan

Printed in Great Britain at the University Press, Cambridge (Brooke Crutchley, University Printer)

PREFACE

A conference on co-ordination of galactic research was held near Groningen, Netherlands, in June 1953. The report given in the following chapters summarizes the most essential parts of the discussions. In accordance with a decision taken during the conference, no attempt has been made to reproduce the various speeches given by the introductory speakers. It was considered more desirable to have a report with the relevent remarks arranged roughly according to the scheme of the memorandum that had been drawn up before the conference as a basis for the discussions. Many topics have been discussed on various occasions and we have attempted to refer to them in the general context of the subject. No attempt has been made to indicate consistently which of the participants was responsible for the opinions expressed in the report—this would have been impossible anyhow, as usually such opinions arose as the result of general discussions of the subject.

Some of the introductory papers have in the meantime been published or are fairly well covered by certain publications. Parenago's introductory speech on recent work of the Soviet astronomers has appeared in *Astronomical Newsletters*, Nos. 71 and 73. In other cases reference to such publications is given in the lists at the end of the report.

In the discussions, the terms 'halo', 'nucleus' and 'disk' are used to indicate different parts of the Galaxy. These general regions are not defined more precisely. Their introduction proved very useful, and one might rather say that their more exact description is one of the problems of galactic research.

The present report was drawn up by the undersigned, as secretary of the Organizing Committee, and submitted for changes and additions to all who had participated at the conference.

A. BLAAUW

LEIDEN OBSERVATORY, 1953 YERKES OBSERVATORY, 1954

CONTENTS

Introduction	page 1
Purpose and character of the conference	I
Formation of new sub-committees in the I.A.U.	2
Introductory papers	3
A (1). Overall Structure: Nuclear Region and Halo) 4
Work on variable stars in the halo	4
Large-scale structure of the halo	4
The photometric scale	7
Soviet survey of variable stars in Kapteyn's Areas	7
General survey of the brightest variables	8
Low luminosity blue stars in the halo	8
Nuclear region	9
Radio surveys	9
Variable stars	9
Planetary nebulae	ΙΙ
Infra-red survey of M giants	ΙI
Novae survey	12
A (2). OVERALL STRUCTURE: SPACE DISTRIBUTION AND	
Motions in the Disk	13
Information derived from the Andromeda nebula	13
Distribution and motion of interstellar gas	15
Super-giants	16
Cepheids	18
Fields to search for faint Cepheids	19
Colours of the Cepheids	20
Long-period variables	20
Survey of other variables in the disk	21
Open clusters	21
Infra-red surveys of M, N and S stars	23
B (1). LOCAL STRUCTURE: DISTRIBUTION OF DIFFERENT	
Types of Stars in the Plane	25
Selection of types of stars for study	26
Further work on the individual stars found in the survey	28

•	i). Local Structure: (cont.)	_
	Choice of the fields	page 29
	Survey of Ao-type stars	30
5	Survey of weak-line and strong-line stars	30
B (2	2). Local Structure: Work in Hi	GH LATITUDES 31
C.	Proper Motions and Radial Ve	LOCITIES 33
	(1) Proper motions: photographic astron	metry of faint stars 33
	Variable stars	33
	Kapteyn's Selected Areas	35
	Milky Way regions of special inter	_
	T Tauri stars	36
	Stars in the outer regions of open	
	Late M-type giants found in the i	·
	Cleveland	37
	Stars with large proper motion Stars in the O associations	37
		38
	(2) Proper motions: meridian observation	•
	(3) Proper motions: the repetition of the	e AGK 2 39
	(4) Radial velocities	40
D.	SPECIAL PROBLEMS	43
	(1) Study of associations	. 4 3
	Nomenclature	43
	Internal motions	43
	Physical properties of stars in asso	ciations 44
	Absorbing matter in associations	45
	(2) Fundamental determination of the correction from radial velocities	
		45
	(3) Trigonometric Parallaxes	46
	Calibration of spectroscopic absolu	
	Absolute magnitudes and motions	
	(4) Stars with large proper motion	46
	(5) Interstellar absorption: dependence	on wave-length 47
	(6) Interstellar polarization	47
Rei	FERENCES	49
Арі	PENDIX	52

viii